Human iPSC Generation from Antigen-Specific T Cells.

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Public Summary:
The discovery and development of induced pluripotent stem cells (iPSCs) opened a novel venue for disease modeling, drug discovery, and personalized medicine. Adoptive T cell immunotherapy is a form of cellular immunotherapy that involves transfusion of functional T cells. However, this approach requires T cell expansion and the process causes T cell exhaustion. As a result, highly expanded T cells have not proven to be particularly effective for treatments. This exhaustion issue could be overcome due to rejuvenation of T cells by reprogramming to pluripotency and redifferentiation to T cells. This is a potential therapeutic strategy for combating various types of cancer. In this paper, we provide a guide to how to perform these experiments.

Scientific Abstract:
The discovery and development of induced pluripotent stem cells (iPSCs) opened a novel venue for disease modeling, drug discovery, and personalized medicine. Additionally, iPSCs have been utilized for a wide variety of research and clinical applications without immunological and ethical concerns that encounter embryonic stem cells. Adoptive T cell immunotherapy is a form of cellular immunotherapy that involves transfusion of functional T cells. However, this approach requires T cell expansion and the process causes T cell exhaustion. As a result, highly expanded T cells have not proven to be particularly effective for treatments. This exhaustion issue could be overcome due to rejuvenation of T cells by reprogramming to pluripotency and redifferentiation to T cells. This is a potential therapeutic strategy for combating various types of cancer.